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Evolution of tuberculosis/HIV co-infection in California during the HAART Era, 1996-2007

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Background

California reports the highest annual number of tuberculosis (TB) cases and over 12% of all persons living with HIV in the US. To assess changes in the intersection of these diseases, we analyzed state-wide data from both registries.

Methods

Incident cases reported to the California TB registry from 1996 to 2007, inclusive, were cross-matched with the state HIV/AIDS registry. Incidence rates of TB with and without HIV co-infection were analyzed for changes in trend. Sociodemographic, clinical characteristics, and treatment outcomes were examined.

Results

2,392 (6%) of 39,718 TB cases during the study period were matched in the state AIDS registry. From 1996 to 2006, annual TB incidence among persons with HIV declined from 368/100,000 to 73/100,000, and without HIV declined from 12.7/100,000 to 7.3/100,000. Comparing the period 1996-2000 with 2001-2007, the proportion of TB/HIV cases increased among Hispanics (48% to 57%; $p < .001$), foreign born (46% to 63%; $p < .001$), and women (14% to 18%; $p = .06$), and decreased among Blacks (28% to 21%; $p < .001$). Male-to-male sexual contact (44% to 41%; $p < .01$) and injection drug use (21% to 15%; $p < .01$) decreased, and high-risk heterosexual contact (9% to 16%; $p < .01$) increased as HIV transmission routes. 77% of all foreign born patients with TB/HIV co-infection originated from Mexico or Central America; the median time from immigration to TB diagnosis was 10.7 (IQR 4-19) years. CD4 count at TB diagnosis (median 78 (IQR 30-167)) was available for 54% of patients. Patients with HIV co-infection were more likely to be sputum smear-positive (OR 1.17 (95% CI 1.08-1.28). Both isoniazid resistance (5% to 7%; $p = .07$) and pyrazinamide monoresistance (6% to 8%; $p = .01$) increased over time in TB/HIV cases but not in cases without HIV. In multivariate analysis, Hispanic ethnicity, older age, and injection drug use were inversely associated with treatment success among TB/HIV cases.

Discussion

In California, the epidemiology of TB/HIV co-infection in the post-HAART era has shifted towards persons of foreign birth, women, Hispanics, and those who acquired HIV through heterosexual sex. In addition, drug resistance has increased in TB/AIDS cases. These changes should be considered in focusing TB and HIV disease prevention and treatment efforts.

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